

Applicant : Kent Harrison  
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Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A medical device comprising:  
an elongate sleeve body having a distal end sized and adapted to enter into a body blood vessel and positionable near a target tissue region within the body; and  
an elongate shaft adapted to be received within the elongate sleeve and having a tissue cooling structure affixed to a distal end of the elongate shaft, the tissue cooling structure being deployable by moving the elongate shaft distally relative to the elongate sleeve to advance the tissue cooling structure from a retracted position within the elongate sleeve to a deployed position that extends from a longitudinally deployable from the distal end of the elongate sleeve, the elongate shaft comprising lumens extending through the shaft to circulate cooled fluid to and from the tissue cooling structure body to cool the target tissue region.
2. (Canceled)
3. (Currently Amended) The medical device of claim 1 wherein the deployable tissue cooling structure comprises a patch having a surface shaped to contact the tissue region.
4. (Currently Amended) The medical device of claim 3 wherein the deployable patch has an inner chamber that receives, from at least one of the lumens ~~a lumen~~ in the elongate sleeve body, a fluid for cooling the patch surface that contacts the target tissue region.

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5. (Withdrawn) The medical device of claim 1 wherein the deployable structure is cup-shaped and has a periphery for contacting body tissue to form a chamber whose bounds are defined by the body tissue and an inside surface of the cup-shaped structure.

6. (Withdrawn) The medical device of claim 1 wherein the deployable structure has an inner chamber with a Joule-Thompson orifice into the inner chamber so that a liquid supplied through the elongate body, through the orifice, and into the inner chamber has a phase change into a gas.

7. (Currently Amended) The medical device of claim 1 wherein the distal end of the device is advanceable through the body blood vessel to the target tissue region when the tissue cooling structure is in the retracted position ~~a non-deployed state~~.

8. (Currently Amended) The medical device of claim 7 wherein the distal end of the device structure cannot be advanced through the body blood vessel when the tissue cooling structure is in the [[a]] deployed position state.

9. (Currently Amended) The medical device of claim 1 wherein the device elongate body ~~further~~ comprises a proximal end that remains outside the body when the distal end of the elongate sleeve body is positioned near the target tissue region.

10. (Currently Amended) A medical device comprising:  
an elongate sleeve body having a distal end sized and adapted to enter into a body blood vessel and positionable near a target tissue region within the body; and  
an elongate shaft adapted to be received within the elongate sleeve and having a tissue cooling [[a]] patch affixed to a distal end of the elongate shaft, the tissue cooling patch being deployable by moving the elongate shaft distally relative to the elongate sleeve to advance the tissue cooling patch from a retracted position within the elongate sleeve to a deployed position

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that extends from a deployable from the distal end of the elongate sleeve, the elongate shaft comprising lumens extending through the shaft to circulate cooled fluid to and from the tissue cooling patch shaft to cool the target tissue region, the patch having a surface shaped to contact the target tissue region.

11. (Original) The medical device of claim 10 wherein the patch comprises a collapsible frame made of a shape memory alloy so that, when deployed, the patch expands to create the surface that contacts the target tissue region.

12. (Canceled)

13. (Canceled)

14. (Currently Amended) The medical device of claim 10 wherein the distal end of the device is advanceable through the body blood vessel to the target tissue region when the patch is in the retracted position ~~a non-deployed state~~.

15. (Currently Amended) The medical device of claim 7 wherein the distal end of the device is not advanceable through the body blood vessel when the patch is in the ~~[[a]]~~ deployed position state.

16. (Currently Amended) The medical device of claim 10 wherein the elongate shaft lumens comprise ~~comprises~~:

- a first lumen to provide fluid to an inner chamber of the patch; and
- a second lumen to remove fluid from the inner chamber of the patch.

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17. (Original) The medical device of claim 16 wherein the inner chamber of the patch comprises a conduit through which fluid flows, the conduit being located adjacent to the surface of the patch in contact with the target tissue region.

18. (Currently Amended) The medical device of claim 10 further comprising at least one additional patch deployable from the distal end of the elongate sleeve body.

19. (Withdrawn) The medical device of claim 10 wherein the patch comprises a thermoelectric cooling element positioned adjacent to the surface of the patch and in contact with the target tissue region that cools the target tissue region.

20. (Withdrawn) The medical device of claim 10 further comprising a balloon positioned adjacent to a surface of the patch that does not contact the target tissue region, the balloon providing insulation between the patch and body fluids when the patch is deployed and positioned near the target tissue region.

21. (Withdrawn) The medical device of claim 20 wherein the elongate body comprises a lumen to provide the balloon with an inflation medium.

22. (Withdrawn) The medical device of claim 20 further comprising an anchoring mechanism near the distal end of the elongate shaft that is connectable to tissues inside the body to anchor the patch when it is deployed near the target tissue area.

23. (Original) The medical device of claim 10 wherein the patch has an inner chamber with a Joule-Thompson orifice into the inner chamber so that a liquid supplied through the elongate shaft, through the orifice, and into the inner chamber has a phase change into a gas.

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24. (Original) The medical device of claim 10 wherein the patch comprises a temperature sensor to sense the temperature of the surface of the patch in contact with the target tissue region.

25. - 34. (Cancelled)

35. (Currently Amended) A method of cooling a target tissue region inside a body, the method comprising:

introducing into a body vessel a distal portion of a catheter having an elongate sleeve body and an inner shaft having a tissue cooling structure affixed to a distal end of the elongate shaft, the tissue cooling structure being in a retracted position within the elongate sleeve ~~longitudinally deployable from a distal end of the elongate body;~~

positioning the distal portion of the catheter near the target tissue region;

moving the inner shaft distally relative to the elongate sleeve to deploy longitudinally ~~deploying the tissue cooling~~ deployable structure from the distal end of the elongate sleeve body;

placing the deployed tissue cooling structure in contact with the target tissue region; and

cooling the deployed tissue cooling structure to cool, but not ablate, the target tissue region.

36. (Currently Amended) The method of claim 35 wherein the deployable tissue cooling structure comprises a patch having a surface shaped to contact the tissue region.

37. (Withdrawn) The method of claim 35 wherein the deployable structure is cup-shaped and has a periphery for contacting to the body tissue region to form a chamber bound by the body tissue and an inside surface of the cup.

38. (Original) The method of claim 35 wherein the target tissue region is within a chamber of the heart.

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39. (Currently Amended) The method of claim 38 wherein the deploying of the deployable tissue cooling structure occurs after the distal end of the catheter is positioned inside the chamber of the heart.

40. (Currently Amended) A method of cooling a target tissue region inside a body, the method comprising:

introducing into a body vessel a distal portion of a catheter having an elongate sleeve body and an inner shaft having a tissue cooling structure affixed to a distal end of the elongate shaft, the tissue cooling structure being in a retracted position within the elongate sleeve ~~longitudinally deployable from a distal end of the elongate body;~~

positioning the distal portion of the catheter near the target tissue region, wherein the target tissue region is within a chamber of the heart;

moving the inner shaft distally relative to the elongate sleeve to deploy longitudinally ~~deploying the tissue cooling deployable~~ structure from the distal end of the elongate sleeve body;

placing the deployed tissue cooling structure in contact with the target tissue region; and

cooling the deployed tissue cooling structure to cool, but not ablate, the target tissue region.

41. (Currently Amended) The method of claim 40 wherein the deployable tissue cooling structure comprises a patch having a surface shaped to contact the tissue region.

42. (Withdrawn) The method of claim 40 wherein the deployable structure is cup-shaped and has a periphery for contacting to the body tissue region to form a chamber bound by the body tissue and an inside surface of the cup.

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43. (Currently Amended) The method of claim 40 wherein the deploying of the deployable tissue cooling structure occurs after the distal end of the catheter is positioned inside the chamber of the heart.

44. (Previously Presented) The medical device of claim 1 wherein the distal end is sized to be entered into a femoral artery.

45. (Previously Presented) The medical device of claim 10 wherein the distal end is sized to be entered into a femoral artery.

46. (Previously Presented) The method of claim 35 wherein the distal portion of the catheter is introduced into a femoral artery.

47. (Previously Presented) The method of claim 40 wherein the distal portion of the catheter is introduced into a femoral artery.